

## Organic/inorganic particulates

**Description of Technology:** This invention concerns an organic/inorganic composite in particulate form prepared by spray drying a solution or dispersion comprising an organic polymer and an inorganic glassy polymer precursor under such conditions that the inorganic glassy polymer precursor forms an inorganic glassy polymer to yield the particulate. Such particulates are useful as reinforcing agents for polymers and in monolithic structures prepared by compression of a plurality of said particulates.

## **Patent Listing:**

1. **US Patent No.** 5,879,796, March 9, 1999, "Organic/inorganic particulates." <a href="http://patft.uspto.gov/netacgi/nph-Parser/Sect1=PTO2&Sect2=HTTOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=5,879,796.PN.&OS=PN/5,879,796&RS=PN/5,879,796

Market Potential: Reinforcement of organic polymers with inorganic materials such as glass, graphite, and clays provides improved properties such as stiffness. The amount of improvement depends on the aspect ratio (ratio of major to minor dimension) of the inorganic material and on its adhesion to the host organic polymer. Often additional components such as coupling agents must be used to provide the adhesion to the, host polymer. In addition, the reinforcement provided by the inorganic materials is generally anisotropic in orientation. Although monolithic structures can be readily prepared from macroscopically reinforced polymers, it is more difficult to prepare them from the intimate type of organic/inorganic interpenetrating or semi-interpenetrating composites of the type described in U.S. Pat. No. 5,252,654 because they tend to be brittle, cracked and warped due to shrinkage resulting from solvent evaporation during their preparation.

It is an object of the present invention to provide an inorganic/organic composite in a particulate form. It is an object of the present invention to provide a reinforced polymer having a reinforcing agent with a high aspect ratio. It is also an object of the present invention to provide a reinforcing agent that possesses isotropic orientation and/or does not require the use of an additional component to provide the adhesion necessary between it and the host polymer. It is a further object of the present invention to provide intimately reinforced monolithic structures that do not warp, crack, or shrink.

## **Benefits:**

- Provides intimately reinforced monolithic structures that do not wrap, crack, or shrink.
- Provides a reinforced polymer having a reinforcing agent with a high aspect ratio.
- Provides a reinforcing agent that possesses isotropic orientation and/or does not require the use of an additional component.

## **Applications:**

• Glass, graphite, and clay products.